

55. The method according to claim 27, wherein the corrosion inhibitor solution is applied between about 3 and about 10 seconds.

56. The method according to claim 27, wherein the pH adjusting agent is selected from the group of a non-oxidating inorganic acid, a non-oxidating organic acid, a non-oxidating inorganic base, a non-oxidating organic base, and combinations thereof.

57. The method according to claim 27, wherein the one or more pH adjusting agents comprise an acidic chelating agent, a basic chelating agent or a combination thereof.

58. The method according to claim 27, wherein the composition further comprises a reducing agent.

59. The method according to claim 58, wherein the reducing agent comprises between about 0.01 wt.% and about 20 wt.% of the composition.

60. The method according to claim 58, wherein the reducing agent is selected from the group of hydroxylamine, glucose, sulfothionate, potassium iodide, and combinations thereof.

REMARKS

This is intended as a full and complete response to the Office Action dated April 8, 2003, having a shortened statutory period for response set to expire on May 8, 2003. Claims 1-60 are pending in the application. The Examiner asserts that claims 1-60 are subject to a restriction and/or election requirement. Applicants elect species I claims, claims 6-8, and 40-42, with traverse, for prosecution with pending generic claims 1-5, 12-39, and 46-60. Applicants cancel claims 5 and 39 without prejudice. Applicants have amended claims 1, 6, 9, 27, and 40, as shown. Applicants believe that no new matter has been introduced in this response.

Restriction to one of the following inventions is required under 35 U.S.C. §121.

- I. Species I, Claims 6-8, 40-42, an acidic chelating agent
- II. Species II, Claims 9-11, 43-45, a basic chelating agent

Applicants elect species I claims, claims 6-8, and 40-42, with traverse. The Examiner asserts that the claims of Species I and Species II are patently distinct species of the claimed invention and that Applicant is required to elect a single disclosed species for prosecution. Applicants have amended independent claims 1 and 27 to include both acidic chelating agent and basic chelating agents. Thus, the species restriction is moot. Applicants respectfully request withdrawal of the restriction requirement to permit prosecution of pending claims 1-60. Allowance of claims 1-60 is respectfully requested.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A method of treating a substrate surface comprising copper or a copper alloy, the method comprising:

applying to the substrate surface a composition comprising:

one or more chelating agents, wherein the one or more chelating agents comprise an acid and a base;

one or more pH adjusting agents to produce a pH between about 3 and about 11; and

deionized water; and then

applying a corrosion inhibitor solution.

6. (Amended) The method according to claim [5] 1, wherein the one or more chelating agents [comprise] comprising an acid [having] has a concentration of up to about 40 wt.% of the composition.

9. (Amended) The method according to claim 1, wherein the one or more chelating agents [comprise] comprising a base [having] has a concentration up to about 5 wt.% of the composition.

27. (Amended) A method of planarizing a substrate surface containing[:]
an dielectric layer having an upper surface and at least one opening[:],
a barrier layer lining the opening and the upper surface of the dielectric layer[:],
and copper or a copper alloy filling the opening and on the dielectric layer[:],
the method comprising:

removing the copper or copper alloy layer and the barrier leaving an exposed substrate surface comprising copper or copper alloy in the opening; and

treating the exposed substrate surface comprising copper or the copper alloy by applying thereto a composition comprising one or more chelating agents, one or more pH adjusting agents to produce a pH between about 3 and about 11, and deionized water, wherein the one or more chelating agents comprise an acid and a base; and then applying a corrosion inhibitor solution.

40. (Amended) The method according to claim [39] 27, wherein the one or more chelating agents [comprise] comprising an acid [having] has a concentration of up to about 40 wt.% of the composition.